

HEALTH STATUS OF THE POPULATION LIVING IN THE GEOTHERMAL AREA OF TUSCANY REGION, ITALY

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Background and Aims: in two areas of Tuscany 31 geothermal power plants have been operating since the eighties. Hydrogen sulphide (H₂S) and mercury vapours in the air, inorganic arsenic in groundwater and in drinking water are the main pollutants. Communities' concern for health effects increased in the last decade. A descriptive epidemiological study commissioned by the Tuscany Region was carried out in 2010.

Methods: sixteen municipalities, 43,400 inhabitants were considered; 60 causes of mortality 1980-2006 and of hospitalization 1998-2006 were compared with regional and local figures (80 municipalities around the study areas). For the total area, 2 subareas and 16 municipalities, standardized and Bayesian age-adjusted rates and clustering analysis were performed.

Results: in the whole area total mortality was in excess for men (SMR=106) but not for women; significant excesses emerged for respiratory causes (SMR=125) and infective diseases (SMR=236) in men, for hepatic cirrhosis among women (SMR=142). No excesses of hospitalization for all causes, all cancers, all cardiovascular diseases resulted; SHR was in excess for stomach cancers in males and females (SHR=146;185), for leukaemia among women (SHR=167). In the northern subarea excesses of hospitalization for leukaemia in women (SHR=250), digestive diseases in both genders (SHR=113) were found. In the southern subarea mortality excesses of total causes, all cancers, respiratory diseases emerged for men (SMR=113;119;128), for acute respiratory and digestive diseases among women (SMR=141;132). Excesses of hospitalization for stomach cancers in males and females (SHR=160;208), kidney failure in both genders (SHR=136), respiratory diseases among women (SHR=113) emerged. Excesses of mortality and hospitalization prevailed in municipalities of southern subarea. Bayesian and clustering analysis confirmed the main results.

Conclusions: although the mortality and hospitalization profiles did not show a critical situation and some excesses were likely to be associated with past occupational exposure or life-style determinants, a GIS assisted case-control study is in progress for some emerged signals, mainly regarding leukaemia, renal and respiratory diseases particularly to assess possible effects of H₂S low doses exposure.